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27 MAR 1998

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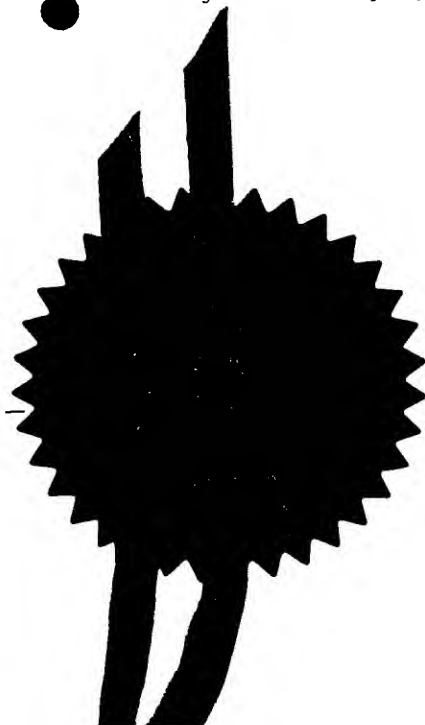
**PRIORITY DOCUMENT**

Signed

*RJ Sanders*

Dated

11/2/98

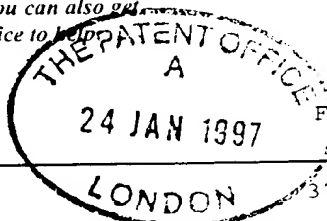


# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form.)

The Patent Office

Cardiff Road  
Newport  
Gwent NP9 1RH



Fee: £25

1. Your reference

2. Patent application number  
(The Patent Office will fill in this part)

24 JAN 1997

9701500.2

3. Full name, address and postcode of the or of each applicant (underline all surnames)

(1) BPB plc  
Langley Park House, Uxbridge Road,  
Slough, SL3 6DU.

7055619001

(2) ~~Moy Isover Limited~~ Moy Isover Limited  
Clonskeagh Road,  
Dublin 4, Republic of Ireland.

F11/77  
17/1/97 DP

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of incorporation

(1) United Kingdom  
(2) Republic of Ireland

7142334001

4. Title of the invention

NON-WOVEN INORGANIC FIBRE MAT

5. Full name, address and postcode in the United Kingdom to which all correspondence relating to this form and translation should be sent

Reddie & Grose  
16 Theobalds Road  
LONDON  
WC1X 8PL

Patents ADP number (if you know it)

91001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application  
(If you know it)

Date of filing  
(day/month/year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day/month/year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body.
- See note (d))

YES

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document.

Continuation sheets of this form

Description	5
Claim(s)	2
Abstract	
Drawing(s)	3

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

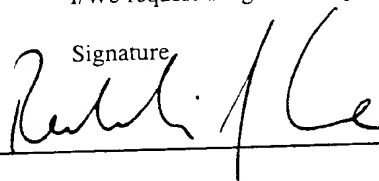
Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature 

Date  
24 January 1997

12. Name and daytime telephone number of person to contact in the United Kingdom

0171-242 0901

**Warning**

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**Notes**

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- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

Fig. 1

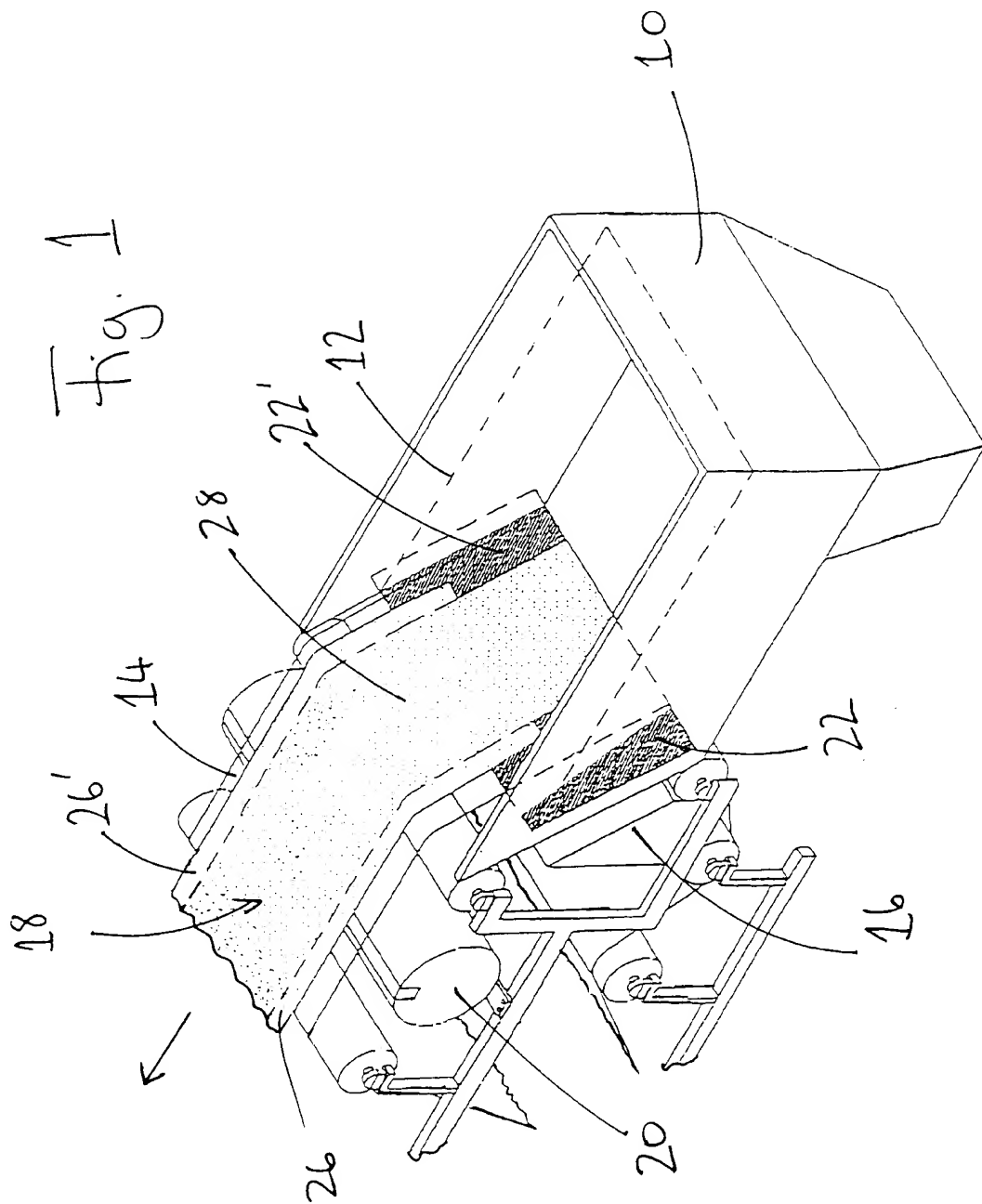


Fig. 2

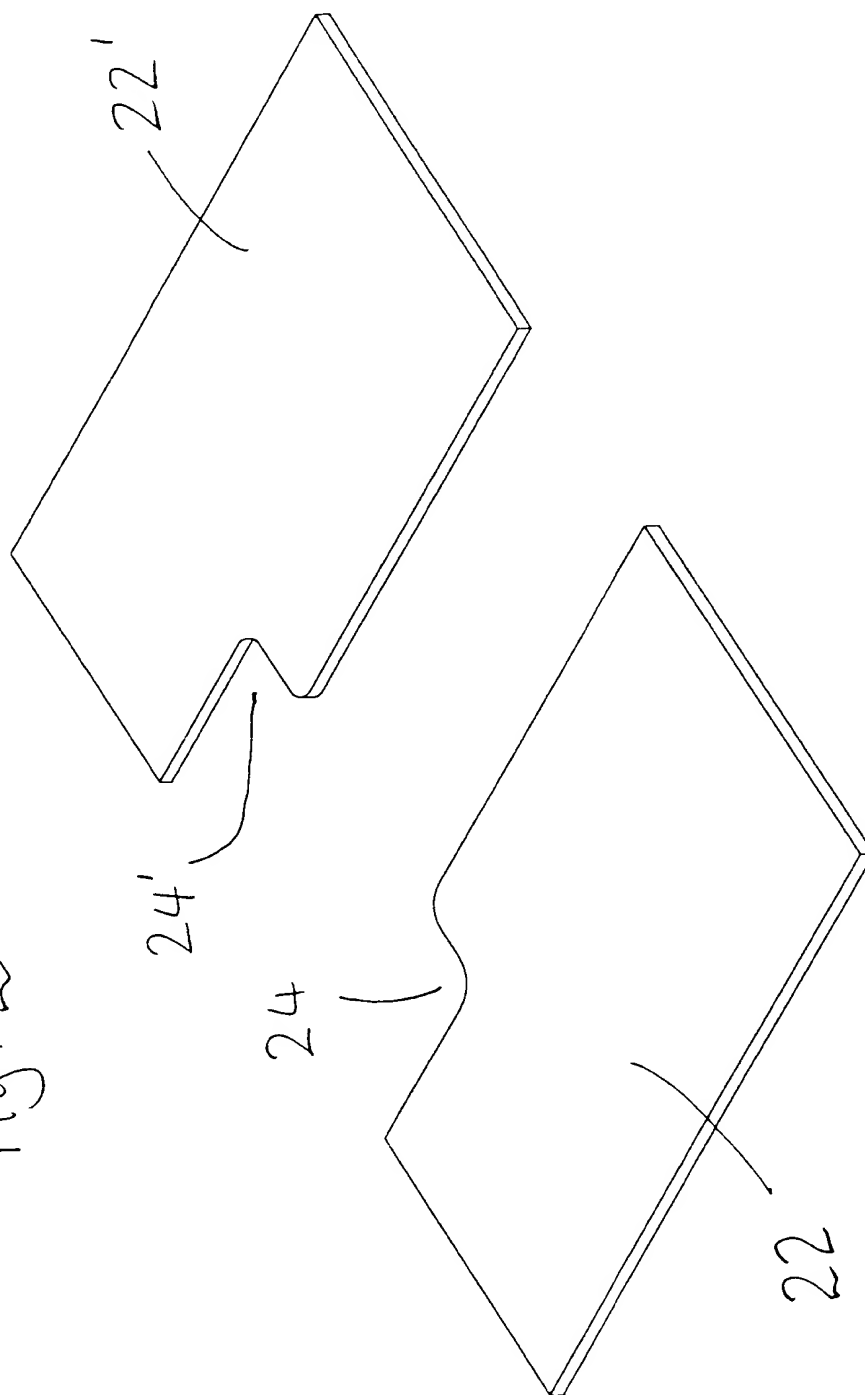
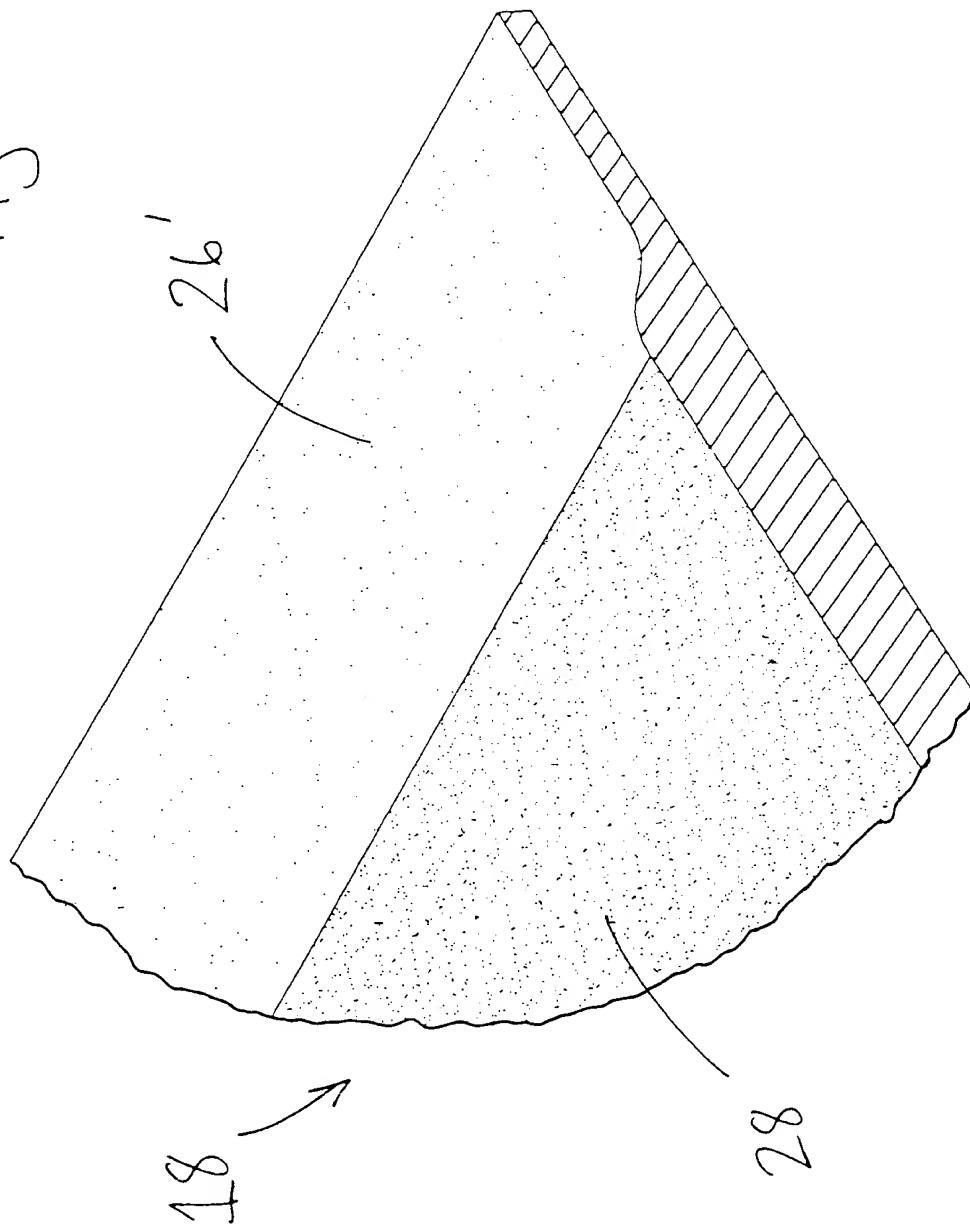


Fig. 3



## NON-WOVEN INORGANIC FIBRE MAT

This invention relates to a non-woven inorganic fibre mat such as a glass fibre mat and to a method and apparatus for the production thereof. It also relates to the use of the mat in building boards, such as gypsum building boards.

A particularly useful form of building board is known as glass reinforced gypsum board (GRG). GRG board and its manufacture is described in GB-A-2 053 779. GRG board is of generally conventional appearance and is composed of a gypsum with a non-woven glass mat immediately below one or both principal surfaces. The mat is introduced into the core by vibrating the core slurry, over- or underlain by the mat, to cause it to pass through the mat, so that the surface layer or layers of gypsum are integral with the core. GRG boards are stronger than conventional boards and exhibit superior fire resistance.

In the manufacture of GRG board the need to provide strength by employing non-woven glass fibre mat of relatively low diameter (for example,  $13\mu\text{m}$ ) fibres conflicts with the need to ensure efficient exhaustion through the mat of air from the gypsum slurry from which the board is formed; this is a particular problem at the edge margins of the board where the bottom mat is brought up and onto the upper surface of the board to define the edges of the uncut board. Inefficient exhaustion of air in this region can lead to voids in the edge margins of the cut boards, reducing the edge strength of the boards.

The problem of voids in the edge margins has been dealt with by increasing the fibre diameter of the mat, particularly the bottom mat (to for example  $16\mu\text{m}$ ), allowing easier exhaustion of air and penetration of gypsum slurry but reducing board strength. However, the use of higher diameter fibres has been found to decrease the strength of the mat. Reduction of the mat substance (weight/unit area), which would allow the gypsum slurry to

inorganic fibre on the forming wire;

a mask across a part of the width of the forming wire to hinder passage of the said liquid through the forming wire over the said part, the effectiveness of the mask varying in the direction of movement of the forming wire past the said source.

Preferably, the mask is disposed across portion of the forming wire corresponding to the edge margins of the formed mat.

Also preferably, the effectiveness of the mask decreases in the direction in which the forming wire is disposed to move.

Also preferably, the mark is a blinding plate impinging the face of the forming wire remote from the source of slurry.

Also preferably, the effective width of the blinding plate decreases in the direction in which the forming wire passes the slurry.

The invention will be further described by way of example, with reference to the drawings in which:

Figure 1 shows, diagrammatically, a perspective view of an inclined wire glass fibre mat former embodying the invention;

Figure 2 shows a blinding plate for use in the apparatus and method of the invention; and

Figure 3 shows a cross sectional view through a glass fibre mat according to the invention.

The former shown in Figure 1 comprises a flowbox 10 containing an aqueous slurry of chopped glass fibre and conventional additives up to the level indicated by the broken line 12. The slurry is continuously supplied to the flowbox 10 from below. A continuous forming wire 14, shown transparent in Figure 1 for clarity, passes through the flowbox 10 at angle to the vertical and the horizontal in the direction shown by the arrow in Figure 1. Slurry is drawn through the wire 14 and into a suction box 16 by a conventional slurry pumping system to form a mat 18 of glass fibres on the wire. Shortly after leaving the flowbox 10, the forming wire 14 carrying the mat 18 of fibres passes over a vacuum header 20 which draws water from the mat 18.



vibrating the core slurry, over- or underlain by the mat, to cause it to pass through the mat, so that the surface layer or layers of gypsum are integral with the core. The lower substance of the edge margins of the mats allow air trapped in the slurry to pass readily through the edge margins of the mat. This avoids the formation of undesirable voids in the edge margins of the board, improving edge strength. Preferred mats for this purpose are of 13  $\mu\text{m}$  diameter glass fibres and have a central substance of about 60  $\text{g/m}^2$  and an edge margin substance of about 27  $\text{g/m}^2$ .

Blinding plates of the invention may be of any desired size and shape to achieve the desired substance distribution across the width of the mat. They may be located at one or both edge margins of the forming wire 14, or one or more may be disposed across the width of the wire. The blinding plates may rest on the wire or be otherwise disposed over the wire but are preferably under it, between it and the suction box 16.

Instead of separate blinding plates, deposition of fibres on the forming wire can be inhibited by treating the wire itself, for example by painting over small areas in regions of the wire to be masked, so that less slurry passes through the wire in these regions, reducing the fibre deposition and thus mat substance. Alternatively, the weave of the forming wire can be made closer in some regions, again reducing the flow of slurry through these regions.

The mats of the invention allow the provision of GRG type plasterboard of improved strength especially at the edge margins. Plasterboard having the same strength edge margins as current GRG boards can be manufactured at higher speeds than are currently possible.

7. A method according to any of claims 3 to 6 in which the masking is of the portion of the forming wire corresponding to an edge margin of the formed mat.

8. Apparatus for forming a non-woven mat of inorganic fibre having a substance (weight/unit area) which varies in the cross direction comprising:

a source of a slurry of inorganic fibre in a liquid;

a forming wire disposed to move past the said source, through which, in use, the said liquid passes to deposit the said inorganic fibre on the forming wire;

a mask across a part of the width of the forming wire to hinder passage of the said liquid through the forming wire over the said part, the effectiveness of the mask varying in the direction of movement of the forming wire past the said source.

9. Apparatus according to claim 8 in which the mask is disposed across portion of the forming wire corresponding to the edge margins of the formed mat.

10. Apparatus according to claim 8 or 9 in which the effectiveness of the mask decreases in the direction in which the forming wire is disposed to move.

11. Apparatus according to claim 8, 9 or 10 in which the mask is a blinding plate impinging the face of the forming wire remote from the source of slurry.

12. Apparatus according to any of claims 8 to 11 in which the effective width of the blinding plate decreases in the direction in which the forming wire passes the slurry.

13. A cementitious board having a sheet of a non-woven mat of inorganic fibre according to claim 1 or 2 embedded immediately below one surface.